NOTES ON INDIAN BUTTERFLIES.

BY

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(*Continued from Vol. XXVII, page* 93.)

29. Bethune Baker in T. E. S. 1918 has issued a revision of the genus *Tarucus* based on the genitalia. He finds that not only are most of the *theophrastus* like forms described by Moore and Butler good species, but that certain additional species exist in India. The following are confirmed as species : *theophrastus*, F.; *nara*, Koll.; *venosus*, M.; *callinara*, But.; *extricatus*, But.; *alteratus*, M. The following are described as new : *callinara nigra* from Karachi, Cutch and Campbellpore ; *bengalensis* described from an unique male from Calcutta and said to be very like the author's *mediterraneæ* from Palestine and Algeria. *ananda*, DeN., hitherto placed in *Castalius*. is removed to *Tarucus* and a new species *dharta*, is described from a pair from Darjeeling, as differing from *ananda* in being smaller, markings more separated below, female with a good deal of blue above and not all brown as *ananda*. *plinius*, F., is now-a-days considered to belong to the genus *Syntarucus*.

Mr. Bethune Baker states that his studies have caused him to reconsider his previous conclusions as to what constitutes a species ; he does not, however, enlarge on this point. I personally think that, as far as the Indian region is concerned, we have only one *theophrastus* like species, but that it is exceedingly susceptible to local influences and that any change in the facies may be correlated with a change in the genitalia. I have no doubt that if someone studied *Terias hecabe*, he could prove to his own satisfaction that the name comprised numerous species. Even Colonel Swinhoe, who is our great exponent of the theory that every variety should rank as a species, fights shy now and then of the school that rely solely on genitalia examinations—*e.g.*, his treatment of the genus *Tapena* in Lepidoptera Indica. The whole question is very intricate and, as an amateur, I am diffident about writing on the subject at all. My own studies have tended to prove that members of the same species from widely separated localities always show differences in their genitalia ; whether such differences would constitute a bar to free interbreeding, it is impossible to say off hand and practically impossible ever to prove ; to me it seems best to treat such differences as racial rather than as specific, though after the lapse of time their specific value may become established. *T. theophrastus*, however, presents a somewhat different problem ; here we have, according to Bethune Baker, a number of different species flourishing in the same area. I have caught the species commonly at Jabalpur and Rawalpindi and more rarely at several other places. I quite understand that the specimens caught in different localities or obtained in the same locality at different seasons are likely to differ and I know that they do differ, but I do not believe that on the same day and in the same place I could capture more than one *theophrastus* like species. I have caught a *venosus* form concurrently with a *nara* form, but no one will persuade me that they were more than ordinary varieties. If, however, two series caught at the same season and in the same locality were shown to differ materially in the genitalia, I might be inclined to reconsider my opinion ; I say "might" advisedly, since other factors have to be taken into consideration, *e.g.*, a brood produced from a food plant other than the normal one might produce an incipient species, which under natural conditions would soon be swamped by the prevailing form. I remember at Jabalpur one day catching a number of dwarf *Tarucus plinius* along with the normal form; I will not venture to say how they were produced, but it never occurred to me that

the dwarfs were anything more than casual varieties. The results of local influences are peculiarly noticeable in the genus *Parnassius* and numerous races have recently been named; the problem is where to stop, I am quite sure that if Mr. Bethune Baker were to employ a large gang of collectors hunting all over India for *T. theophrastus*, he would more than double his list of species in a very short time.

30. Fruhstorfer in Tijd voor Ent, 1918 gives us a revision of the genera *Castalius* and *Heliophorus* (= *Ilerda*), based on the genitalia, together with other notes. He puts *Taraka* next *Castalius*, a change that is not justified by the habits; *hamada* is confined to Japan and Formosa, the Indian race being christened *mendesia*. *Orthomiella* is sunk *to Una*, a rather strange proposition, while *rovorea* is described from the Chin Hills as a race of the Sikkim *pontis*. In *Castalius*, the species *ananda* is included; *approximatus*, But., is given as the Burmese race of the Indian *rosimon*; *roxana* as the Indian race of the Javan *roxus*, *manluena* being the Nicobar one; *elna noliteia* is named as the *elna* race from India and Burma; *decidia* is placed as the Indo-Burmese race of the Celebesian *caleta*, Hew., the Ceylon race being *hamatus*, M.; the Andaman forms of *elna* and *roxus* are placed as unnamed races.

Heliophorus indicus, Fruh, is given as the race of the Javan *epicles* flying from Sikkim to North Burma; as a matter of fact *epicles* occurs as far South as the Karen Hills in Burma and also in the Middle Andaman. *Birmana* is given as a new race of the W. China *saphir* Blanch, as from Upper Burma. *Androcles androcles* (= *viridis*, mihi) is given from the E. Himalayas and *androcles coruscans*, M., from the W. Himalayas; Fruhstorfer is no doubt right in assuming that Doubleday's types came from the E. Himalayas.

31. Fruhstorfer in Leiden Zool. Med. 1916 deals with the genera *Lycœnesthes and Nacaduba*, basing his results on genitalia examination.

andamanicus is named as the race of the Indian *emolus*. *lycœnina* is confined to Ceylon and *lycambes*, Hew., given as the N. Indian race; he does not tell us what we are to call specimens of this species from S. India and Burma.

In *Nacaduba* several important changes are made and I append a list of the Indian species and races.

pavana, Hors., Java, with races; *nabo*, Fr., India and ? Andamans; *vajuna*, Fr., Siam and Burma; Ceylon not mentioned.

augusta, Druce, Borneo, race *kerriana*, Dist. Tenasserim.

pactolus, Fd., Amboina, with races; *ceylonica*, Fruh., Ceylon; race unnamed S. India; *continentalis*, Fruh., Sikkim to Burma; *andamanica*, Fruh., Andamans; *macropthalma*, Fd. Nicobars.

nora, Fd., S. Moluccas with race *noreia*, Fd. Indian region.

aluta, Druce, Borneo, race *coelestis*, DeN., N. India and N. Burma; unnamed race, Andamans.

dana and *hampsoni*, DeN., Indian region.

viola, M. Sikkim to Burma and Andamans; race *merguiana*, Fruh, Mergui,

ancyra, Fd., Assam to Burma and Nicobars.

berenice, H. S. locality not clear but presumably Malayan, with races; *ceylonica*, Fruh, Ceylon; *plumbeomicans*, W. M., Andamans and India; *aphya*, Fruh, Siam and Rangoon, *nicobaricus*, W. M. Nicobars.

atrata, Hors, Java with race *gythrion*, Fruh, Indian region (Lep. Ind. Plate, 658 (3 to 3a.)

perusia, Fd., S. Moluccas with races; *prominens*, M., Ceylon (Lep. Ind. plate 658 3 c. to 3d.); *euplea*, Fruh, India and Burma.

The difference between *atrata* and *prominens* would seem to need further investigation. I have personally no doubt of the specific distinctness of the tailed and tailless forms of what DeNiceville treated under the name *ardates*. In J. B. N. H. S. 1910 I described the tailless female from Sikkim with a yellow underside as *sivoka*. Swinhoe in Lep. Ind. calls the tailless and tailed forms

nora and *noreia* respectively and I think they might stand as *nora sivoka* and *noreia*. I am not quite clear what Fruhstorfer's intentions are in respect of *bhutea*, DeN., but I imagine he wishes to unite it to *noreia ; bhutea* is in my opinion a perfectly good species, of which I described the Palni Hills race as *kodi* in J. B. N. H. S., 1910.

32. Reverdin in Etudes Ent. Comp, 12, issues a revision of the genus *Hesperia* (palearctic), based on the male genitalia. Chapman in Ent. Rec. 1917-1919 reviews Reverdin's results and gives his own. Amateurs, who are interested in the study of genitalia, should read Dr. Chapman's introductory remarks. Mr. Pierce's works on the genitalia of the British *Noctuidæ* and *Geometridae* are no doubt excellent, while Mr. Bethune Baker's writings and photographs are full of interest, but nothing I have read has been so clear and simple as Dr. Chapman's short exposition referred to above.

33. Mr. E. J. Godfrey in J. N. H. S. Siam 1916 gives an interesting list of the butterflies of Siam and describes a few new races and species of which the most interesting is a new *Everes*, viz., *rileyi* ; said to be like *dipora* above. and *parrhasius* below ; Bangkok, Siam ; it is the only *Everes* recorded from Siam.

34. Hampson in N. Z. XXV, issues a list of families and sub-families of the order Lepidoptera. The Rhopalocera come thus between No. 37. Castniidæ and No. 44. Euschemoniidæ.

38. Danaidæ. (for Nymphalidæ).
    Euplœinæ. (for Danainæ).
    Maniolinæ. (for Satyrinæ).
    Æginæ. (for Morphinæ).
    Acræinæ.
    Danainæ. (for Nymphalinæ).
39. Asciadæ. (for Pieridæ).
40. Cupidinidæ. (for Lycænidæ).
41. Plebejidæ. (for Nemeobidæ).
    Plebejinæ. (for Nemeobinæ).
    Libythæinæ.
42. Equitidæ. (for Papilionidæ).
43. Erynnidæ. (for Hesperiidæ).

I suppose some useful purpose is served by this kind of thing but nothing annoys the amateur student so much as apparently useless changes in nomenclature. It is a great pity that we have no international authority empowered to issue an authoritative list of known families, genera and species ; any alterations or additions might be proposed by individuals but should not come into force unless formally approved by the central authority after due discussion in scientific journals. All delving into the records of the past should be vetoed, as far as nomenclature is concerned the result would be that the energies of many excellent naturalists would be diverted to useful progressive work, from what may be termed useless retrogressive work.

35. All entomological students will welcome Mr. T. R. Bell's important contribution towards the classification of the Hesperiidæ in a recent number of the journal. His results are primarily based on the early stages and of this branch of lepidopterous entomology, not only is Mr. Bell a master, but it is a deplorable fact that he is the only real student we have ; a Mr. Bell in Tavoy and another in Assam would very soon put us all straight. I have devoted considerable attention to this family and am acquainted with the habits of the imago of most of the known species. I have also examined the structure and genitalia of many species, but in this latter branch of study Mr. Ormiston of Ceylon leads the way. Mr. Ormiston has published his results as regards the Ceylon Skippers, but I understand he has been studying those from other districts and I hope that in due course he will publish his further results.

I think that there is no doubt that the data in which Mr. Bell relies are far and away the most satisfactory for purposes of classification and that study of the habits as well as what may be termed cabinet investigation are little more than confirmatory ; yet, as Mr. Bell points out, there are many species and even genera whose early stages are entirely unknown and all we have to go on for the present are the habits and the results of examination of the imago. I had already worked out a rough classification of the family and find that my results accord very closely with Mr. Bell's. I give below the points on which we differ.

(*a*) I agree with Swinhoe in putting the Ismeninæ at the head of the family. I quite understand Bell's reasons for putting them after the Hesperiinæ, but they differ more from all the other sub-families than the latter do inter se.

(*b*) Ormiston is of opinion that *Hantana infernus* is the male of *Celænorrhinus spilothyrus* and I am pretty certain that he is right, in which case it would be wrong to put *Hantana* in any sub-family other than the Celænorrhinæ. Again from genitalia examination it is evident that *Achalarus* is a very close ally of *Celænorrihinus*, while *Capila* and its allies, with their very peculiar, large trifid clasp, are quite separate and might be classed as Capilinæ.

(*c*) Following the Celænorrhinæ, the Hesperiinæ come in naturally but, after the Hesperiinæ I should prefer to see the Pamphilinæ which are decidedly allied to the Hesperiinæ. I should follow thus—Plastingiinæ, Notocryptinæ, Erionotinæ and Erynninæ, wherein I would include the Baorinæ, as the latter group seem barely separable as a sub-family.

(*d*) I am surprised to see *Baracus* near the end of the Erynninæ and would prefer to see it next *Astictopterus*, which with its allies seems to come better into the Pamphilinæ. *Pithauria* (includes *Pithauriopsis*) should come between *Halpe* and *Parnara*, where perhaps *Iton* is also better placed. *Œrane* is probably a near ally of *Notocrypta*, *Hidari* of *Erionota* and *Acerbas* of *Plastingia*.

My arrangement would therefore be as given below and I think it more or less brings together the order followed by Watson, Elwes and Swinhoe with that given by Bell: I cannot, however, persuade myself to adopt al Swinhoe's new genera.

Ismenina.	Ismeninæ.	*Bibasis. Hasora. Ismene. Rhopalocampta. Badamia.*
Hesperiina.	Capilinæ.	*Capila. Crossiura. Orthopœtus. Calliana.*
	Celænorrhinæ.	*Charmion. Achalarus. Hantana. Celœnorrhinus. Coladenia. Gerosis. Sarangesa. Darpa. Tapena. Ctenoptilum. Odontoptilum. Caprona. Satarupa. Tagiades. Odina.*
	Hesperiinæ.	*Gomalia. Carcharodus. Hesperia. Thanaos.*
Pamphilina.	Pamphilinæ.	*Pamphila. Taractrocera. Ampittia. Aeromachus. Ochus. Baracus. Astictopterus. Koruthaialos. Iambrix.*
	Plastingiinæ.	*Suada. Suastus. Pedestes. Arnetta. Sebastonyma. Itys. Isma. Zographetus. Scobura. Sepa. Pirdana. Plastingia. Lotongus. Acerbas. Creteus.*
	Notocryptinæ.	*Hyarotis. Udaspes. Notocrypta. Oerane. Sancus. Kerana. Watsoniella. Tacupa.*
	Erionotinæ.	*Hidari. Erionota. Pudicitia. Gangara. Paduka. Matapa.*
	Erynninæ.	*Cupitha. Erynnis. Augiades. Telicota. Actinor. Halpe. Onryza. Pithauria. Iton. Parnara. Gegenes. Eogenes.*

36. A note on the sub-family Poritiinæ.

I have recently returned from a 5 months collecting tour in Burma and was fortunate enough to obtain some 200 specimens appertaining to 10 different species of the genera *Poritia, Simiskina* and *Zarona.* The literature dealing with this sub family is most confusing and I hope that this note will clear up most of the doubtful points and that the keys will enable collectors to identify their captures more easily than heretofore.

I will take in turn the species of *Poritia* that have been described from India or the Malay Peninsula.

(*a*) *sumatræ,* Fd, is a very distinct species about which there is no confusion. I personally did not meet with it, but Bingham recorded it from the extreme South of Tenasserim. Distant's figure in Rhop. Mal. of *sumatræ* ♀ var is undoubtedly referable to *geta.*

(*b*) *hewitsoni,* M., is a well known species. Doherty (J. A. S. B. 1889) described some specimens he caught at Myitta, Tavoy, as *hewitsoni* var. *tavoyana,* but, as he seems to have mixed up this species with *geta, erycinoides, pleurata* and possibly others, it is difficult to say what *tavoyana* is referable to. There is however no doubt that Burmese specimens of *hewitsoni* differ from Indian ones in the reduction of the blue spotting of the apical area of the forewing and *tavoyana,* might stand as the Burmese race of *hewitsoni.* I only met with this species rarely on the East side of the Dawna range. It is probably commoner in Upper Burma.

(*c*) *pleurata,* Hew, Singapore. The description mentions 2 blue spots on the black apex of the male, which are missing in the plate. De Niceville, Elwes and Bingham have all identified *geta* as this species, but Swinhoe very correctly pointed out the error in Lep. Ind. At the foot of the Dawnas on the East side I caught 14 males and 3 females of a species I am naming *dawna* ; it is nearer Hewitson's figures of *pleurata* than is *geta,* but there are certain pronounced differences. It is possible that *dawna* may turn out to be the Burmese race of the Singapore *pleurata.*

(*d*) *geta,* Faw., Toungoo. This species is well figured by Swinhoe in Lep. Ind. and the female by DeNiceville in his Vol. III, under the name *pleurata.* I found it common in the Karen Hills and the Dawnas, rather rare in Tavoy and Mergui. Specimens from Mergui (King Island) have the blue apical markings reduced and I propose to call them race *regia.* The spring form of *geta* in the Karen Hill is larger and greener than the autumn form.

erycinoides, Fd., was described from a male from Java and *phraatica,* Hew., from a female from Singapore. I feel convinced that, as pointed out by DeNiceville in J. A. S. B. 1895, these names represent the male and female of the same species. Distant in Rhop. Mal. described and figured a male to fit Hewitson's female ; I think his male probably=*pleurata.* Bingham in the Fauna and Swinhoe in Lep. Ind. followed Distant but confessed they had never seen a male *phraatica.* Bingham seemed to think that *erycinoides* was merely a blue variety of *hewitsoni* ; he assigned to it a *hewitosni* like female and said he had only seen 3 males and 2 females. Swinhoe in Lep. Ind. says that Bingham is entirely wrong about *erycinoides* ; he claims to have specimens from Mergui and says that Druce has it from Sikkim ; he figures a male, which he says resembles Felder's type exactly and he gives it a female, which differs but slightly from Hewitson's figure of *phraatica.* Now I found a (blue not greenish blue as in the rest of the genus) male, matched by a female with yellow discal areas, to be very common in Tavoy and not uncommon in

the Karen Hills, the Dawnas and Mergui; on several occasions males and females were taken in coitu. The male agrees fairly well with Felder's figures of *erycinoides* and the female with Hewitson's figure of *phraatica*, but both sexes were extremely variable. In De Niceville's collection there is a series of this species from Burma, the Malay Peninsular, Sumatra and Java. Javan specimens differ from the remainder in the much greater extent of the blue areas and resemble exactly Swinhoe's figure of male *erycinoides* in Lep. Ind. Felder's figure curiously enough resembles the continental form more than the Javan. Fruhstorfer (B. E. Z. 1911) confines *erycinoides* to Java and puts *phraatica* as the continental race: this is very likely the correct course.

(*f*) In the Karen Hills in November I obtained a species of *Poritia*, which is not referable to any known species and which I propose to call *karennia*. The male is not unlike *hewitsoni*, but the yellow female is very different, while the underside in both sexes is strikingly different to that of any other member of the genus. I personally only caught 2 males and a single female, but there are other males in Mr. W. Archbald's collection caught both in the spring and the autumn and there are 2 males in DeNiceville's collection over the label *pleurata*, which is the dumping ground for all *hewitsoni* like species from Burma. Elwes in P. Z. S. 1892 mentions that Doherty obtained in the Karen Hills 2 yellow females, which he suggests may be dimorphic females of *pleurata* (recte *geta*), but I think they were probably females of *phraatica*.

I will now turn to the genus *Simiskina*, which differs slightly from *Poritia* in the secondary sexual characters of the male and very markedly on the underside, which does not have the crowded catenulated bands common to every *Poritia*.

(*g*) *phalena*, Hew. (=*harterti*, Doh.) presents no difficulty. I caught one pair in the Tavoy district and DeNiceville has a few specimens from Katha. Fruhstorfer puts *harterti* as the Assam race in spite of Hartert's own assertion that his unique specimens from the Patkoi Hills differed in no way from specimens he caught in Sumatra.

(*h*) *pediada*, Hew., presents no difficulty. I caught several males and females in the Tavoy district.

(*i*) *phalia*, Hew., male, Borneo; *potina*, Hew., female, Singapore: *fulgens* District Malay Peninsular were, I think rightly united by Bingham under the name *phalia*, but he figured a variety of the female which led Fruhstorfer (B. E. Z. 1911) to call the Burmese race of *phalia* (=*potina* and *fulgens*) *binghami*. Swinhoe in Lep. Ind. treats *phalia* and *potina* (=*fulgens*) as distinct species; having never seen a male *potina*, he copies Doherty's figure (J. A. S. B. 1889), while for *phalia* he figures a male from Burma, which differs very slightly from his figures of male *potina*, and he allots to it a purple female from Labuan. Now I obtained several males and females of what I call *phalia* in the Dawnas, Tavoy and Mergui. Except for one Dawna specimen the males are pretty constant and resemble Hewitson's and Doherty's figures. Females were very variable and every gradation was obtained from Bingham's figure with no black shading on the upperside of the forewing along the dorsum, to Hewitson's figure with an entirely black inner margin. The aberrant Dawna male is not unlike Swinhoe's figure of *phalia*, but the blue markings are more extended, the discal and sub-marginal spots being completely joined in space 1 forewing and in 1 to 4 hindwing, while the streak in 1-a forewing extends to the base; the blue

colouring is pure blue with no hint at green as is the case with all normal males; at present I intend to treat it as a variety of *phalia*. What Swinhoe's purple female from Labuan is I cannot say, but it does not concern us in India at present.

There are two other members of the genus *Simiskina* that may turn up in Burma, *viz.*—*pheretia*, Hew., Singapore; male below rather as *phalena*, but above the hindwing is mostly pale blue; female brown above with the termen or the hindwing broadly pure white; *pharyge*, Hew., Borneo, Malay Peninsular and Renong, Siam; not unlike *pediada*, but easily recognised by the presence of a bright blue submarginal line on the hindwing below.

On two occasions a male and a female of *Zarona jasoda* were caught in coitu, which puts an end to the doubt that has always existed, as to whether *jasoda* and *zanella* were different species. A few specimens of both sexes were obtained in the Dawnas, Tavoy and Mergui. Fruhstorfer has sunk *Zarona* to *Deramas* and calls *jasoda* a race of the Malayan *livens;* the only difference between the two is the secondary sexual characters; Distant asserted that they were present in *livens* and there are certainly none in *jasoda*. I have not seen *livens*, but I can quite believe that Fruhstorfer is right and *jasoda* may well be a race of *livens*, that has lost its secondary sexual characters.

Cyaniroides libna was not met with.

Key to *Poritia*.

Note.—All males are very similar and are brilliant blue or green above with a broad black apex to the forewing, which, when the spotting is fully developed, bears sub-marginal blue spots in 2 and 3 joining, a diagonal series beyond the end of the cell leading to the costa. The presence or absence of a black spot of varying size about the middle of vein 1 upf. and of marginal spots uph. are variable individual and not specific characters.

1-a. (6). ♂ uph. blue colour extends above vein 4 into space 4, at least near the margin.

1-b. (4-a). ♂ upf. cell entirely black.

1. (2-a). ♂ upf. blue colour not above vein 2; green rather than blue; apical area f. unmarked. Uph. lower part cell and all 4 blue. ♀ purple with a black apex bearing two rows of purple spots, the outer spots being separated by ochereous lines. Below the catenulated bands are even, continuous and parallel to one another, not discontinuous and irregular as in the rest of the genus.

sumatræ, Fd. Extreme South of Tenasserim. (Bingham).

2-a. (1). ♂ Upf. blue colour extends into 2 and often into base of 3.

2. (3) ♂ uph. cell and basal part of 4 blue; blue rather than green; apex unmarked except for marginal spots in 2 and 3. ♀ yellow, costa, termen and outer third of dorsum f. dark brown, width ·1 inch; h. entirely yellow except that the costa is whitish, the base has some dusky brown shading and there is a row of dark brown sub-marginal spots. Below white, catenulated bands as usual, but differs conspicuously from the rest of the genus in that on the upper part of the disc f. and near the apices f. and h. there are prominent large bright brown burnt sienna patches.

karennia, nov. Karen Hills, 3,000 feet.

3. (2). ♂ uph. lower part of cell and all 4 blue, with a dark streak at end cell; green rather than blue. ♀ upf. pale purple blue in 1a, 1 and centre of 2 with an orange patch in 3, sometimes extending into 2; cell black and apical spotting as in the ♂ but better developed; uph. black except for a rather small blue discal patch. Below smoky grey to pale cinnamon.

A. upf. apical spotting well developed in both sexes.

hewitsoni hewitsoni, M., Kumaon to Assam.

B. Ditto much reduced and sub-marginal spots absent.

hewitsoni tavoyana, Doh., Burma.

4-a. (1-b). ♂ upf. cell all blue.

4. (5). ♂ uph. lower part cell and all space 4 blue ; green rather than blue. ♀ pale blue obscurely shot with violet, black areas as in ♂ but apical spotting more developed ; uph. sub-marginal dark spots prominent. Below pale cinnamon, but sometimes smoky grey in ♂.

A. Apical spotting well developed, especially spots beyond cell in ♀. In ♂ blue colour always extends into 3 upf.

geta geta, Faw., North Burma to Tavoy.

B. Apical spotting much reduced, ♂ spotless and ♀ only with sub-marginal spots in 2 and 3. In ♂ blue colour does not extend into 3 upf.

geta regia, nov. Mergui.

5. (4). ♂ uph. lower part cell and basal half space 4 black ; blue rather than green ; upf. the lower edge of the cell is narrowly black from the middle to the outer end and the blue colour extends into 3, apex only obscurely spotted; uph. marginal spots and sub-marginal dark fascia better developed than usual. ♀ rather pale blue with a green tinge, when looked at sideways ; extent of blue area and spotting as in male, but latter much more developed ; upf. base dusky, leaving a prominent blue spot in middle of cell ; uph. costal margin dusky and there is sometimes a blue spot in 5 near the margin. Below creamy white, catenulated bands rather faint.

dawna, nov. Eastern Dawnas, 1000 feet.

6. (1-*a*). ♂ uph. cell and whole of space 4 black ; rich royal blue with no tinge of green, thus presenting an entirely different appearance to the rest of the genus ; upf. a narrow blue streak inside the cell from the extreme base of the lower edge to the middle ; the spotting on the black apex is usually very well developed (in the Javan race the apical and the discal blue areas merge) but specimens occur, which are entirely black on both wings except for a few blue spots. ♀ above dark brown with an orange yellow discal patch upf. and a discal fascia uph of very variable extent, also uph. some more or less obscure orange sub-marginal patches and an ochreous sub-terminal line. Below ♂ smoky grey ; ♀ creamy white.

erycinoides phraatica, Hew., Burma.

Key to *Simiskina*.

Note.—Males are very alike above, but the pattern is quite different to *Poritia* ; black with brilliant blue or green markings. Upf. a streak from vein 1 to vein 4 along and below the median vein, outwardly irregular and produced outwards in space 2 ; 2 or 3 spots beyond the end of the cell and a complete sub-marginal series curved inwards at the upper end; a short diagonal streak in the middle of 1-a with a small spot above its outer end in 1. Uph. a streak in 1 from the base to the disc and discal spots above its lower end in 2 and 3; sub-marginal spots in 1, 2 and 3, the former being the largest and sometimes conjoined to the streak in 1 ; costa broadly pale brown. Below there is a dark line at the end of the cell on both wings, a curved discal and a similar post discal line.

1. (2-*a*). Below a white band across both wings in both sexes. ♂ above markings brilliant green. ♀ above brown with a prominent white discal spot upf.

phalena, Hew. Assam to Burma.

2-a. (1) Below no white band.

2. (3). ♂ above markings brilliant green ; Unf. apex only slightly if at all paler. ♀ uniform dark brown above.

pediada, Hew., South Burma.

3. (2). ♂ above markings brilliant blue, sometimes tinged with green: unf. apex conspicuously paler than the rest of the wings. ♀ orange yellow ; upf. apex and termen dark brown and sometimes with dark brown shading of varying

width and intensity along the dorsum and a thin line at the end of the cell; uph. entirely orange yellow, sometimes suffused with brown scales at the base and on the side disc and forming brown sub-marginal spots.

phalia, Hew. South Burma.

37. I have to note the following additions to the Indian List.

(*a*) *Cirrochroa orissa*, Fd., Malay Peninsula, Sumatra and Borneo. Discovered by Messrs. O. C. Ollenbach and W. A. Wood in Tavoy. Caught by me on King Island, Mergui, in December. It differs from all other members of the genus in having a very broad pale yellow band across the forewing.

(*b*) *Papilio varuna*, White, Malay Peninsula. Two females caught by me on King Island, Mergui, in December. It differs from the race *astorion*, Wd., in that the female has a very large white patch on the lower part of the disc upperside forewing.

(*c*) *Arhopala ormistoni*, Riley. The Entomologist, May 1920. This is a new species obtained by Mr. W. A. Ormiston at Nakiadenya near Galle in April. It is said to be nearest to *alitœus* and *mirabella*.

(*d*) *Mantoides licinius*, Druce, Borneo. Discovered by Messrs. Ollenbach and Wood on a hill at Pagaiye in Tavoy and a pair obtained by me on the same spot in December. In general appearance and size like *Cheritra freja*, but the long tail is at vein 1 and the short tail at vein 2, not the other way about as in *freja*; also the white area at the anal angle is greater. Below the general tone is pale yellow brown except along the dorsums of both wings, where it is white. The male has pronounced secondary sexual characters, *viz.*, a large polished area on the disc of the hindwing upper hind and a pouch at the end of space 6; on the underside of the forewing there is a prominent upturned tuft of hairs from the middle of the dorsum, which is highly convex, nearly to vein 2 and overlying a dull lead grey patch, denuded of scales.

(*e*) *Jacoona anasuja*, Fd., Malay Peninsula. Obtained by Messrs. Ollenbach and Wood and subsequently by me at the same place and month as *Montoides licinius*, to which group it belongs, as regards shape and tails, but the male has no secondary sexual characters. It is a much larger insect, being 2 inches in expanse and the male is very magnificent above, being dark brown with a brilliant dark blue area at the base and a similar pre-apical patch on the forewing, a blue streak on the hindwing from the base to near the centre of the termen and there is the usual anal white patch. The female is without the blue areas. The long tail is 1 inch in length and the short tail a quarter of an inch. Below it is white, the forewing being for the most part pale yellow brown, shading to bright ferruginous at the termen and the apex.

(*f*) *Biduanda nicevillei*, Doh, female. I obtained a few males of this very distinct species at Kanbauk and Pagaiye, Tavoy, and a single female at Pagaiye, in December. It is very similar to the female of the commoner *Biduanda melisa*, M.; above there is the same blueish white patch at the anal angle of the hindwing but on the forewing there is a large red discal patch. Below the two species are very alike differing constantly as follows. On the forewing of *melisa* there is white patch on the dark discal area beyond the cell, below which there is an irregular and more or less double dark streak to vein 1; on the hindwing the inner of the two dark lines at the end of the cell is much thicker and partly coalesced to the outer line. On the forewing of *nicevillei* there is a very narrow white line on the dark area beyond the cell, below which there is

an even single ochreous streak to vein 2, continuing as a broader, but single, dark brown streak to vein 1 ; on the hindwing the two lines at the end of the cell are even and well separated.

(*h*) *Semanga superba*, Druce, Malacca and Borneo. A single female of this species was caught by Mr. E. Fowle on King Island, Mergui, and is now in my collection. It is a close ally of *Catapœcilma elegans* as regards shape, size and tails ; in facies it is startlingly like the widely separated *Ilerda epicles*. Above it is lilac blue with brown borders and there is a broad sub-marginal ochreous band along the lower part of the termen of the hindwing. Below it is ochreous yellow with a narrow brown discal line on the forewing and the outer half of the hindwing is reddish brown, interspersed with black spots and pale silver blue dashes.

(*i*) Some time ago Mr. G. H. E. Hopkins sent me some specimens of a small *Sarangesa* he had captured during the cold season at St, Thomas Mount, Madras. It is a close ally of *Sarangesa sati*, De N., but in my opinion differs sufficiently to be accorded specific rank and I will call it *hopkinsi*, nov. Above inky black frosted over with minute white scales ; unspotted (*sati* bears numerous small hyaline white spots). Below dark brown and spotted after the same manner as *sati* and *purendra*, but the spots are smaller and fewer. The cilia are prominently chequered. Expanse 9 to 1 inch.

(*j*) *Isma purpurascens*, El, Pulo Laut. Several specimens caught by me at the foot of the Dawnas on the East side in January. It is very similar to *Isma protoclea*, but is purple washed below.

(*k*) *Sepa noctis*, Stg. One male at the foot of the Dawnas on the East side in January. It is a rather small plain brown skipper with a pointed forewing.

(*l*) *Acerbas nitidifasciata*, El, Labuan and Borneo. Two males obtained at the foot of the Dawnas on the East side. A rather large dark brown skipper bearing white spots on the forewing and distinguished by having on the underside of the hindwing a broad curved silver white band with even edges from the costa to the dorsum. In *anthea* this band is very irregular outwardly ; *anthea* also differs in having no cell spots on the forewing and in having a discal white band on the hindwing above.

(*m*) *Telicota paragola*, De N. King Island, Mergui. Several specimens were obtained in January. Above this form is exactly as typical, *gola*, but below there is a very marked difference, though it is only one of degree ; the ground colour is very dark brown and the yellow bands on both wings stand out conspicuously ; in the typical form the ground colour, except along the dorsum of the forewing, is overlaid with yellow scales so that the yellow bands are not nearly so conspicuous.

38. I am glad to be able to announce that Mr. N. D. Riley of the British Museum has undertaken the preparation of Volume III of the Butterflies in the Fauna of India series. Its publication will supply a long felt want and I am certain that the work could not have been placed in abler hands.

39. Swinhoe in A. M. N. H. S. 1919 describes ;

(*a*) *Zephyrus pavo*, De N., male from Simla as an insect, which is green above. He is wrong. The male of *pavo* was obtained by Col. Tytler in the Naga Hills (J. B. N. H. S. XXIV 125) and closely resembles the female ; I have a pair in my collection. This species is certainly not to be caught anywhere near Simla and Swinhoe's insect is a variety of *syla*, *ataxus* or *birupa*.

(*b*) *Tajuria drucei*, Swin, female from the Shan States in Burma, said to be very like *Tajuria jehana.*

(*c*) *Lycœnopsis trita*, nov. from Murree. The N. W. Himalayas are too well known for anyone to expect to find a new species of this genus and *trita*, I have no doubt is merely a variety of *cœlestina* or *huegeli.*

(*d*) *Arunena* (nov.) *nigerrima*, nov. from the Khasi Hills. A plain black skipper with no markings and an expanse of nearly $1\frac{1}{2}$ inches. Swinhoe places the genus in his sub-family *Astictopterinœ* but neither in his description of the genus nor of the species does he give any comparison with its nearest allies ; so, as there is no figure, further identification will be hopeless unless he lodges the type in the British Museum.